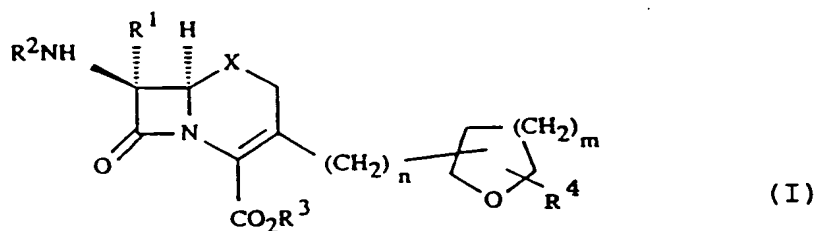


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(57) Abstract

β -Lactam antibiotics of formula (I) or a salt thereof, wherein R^1 is hydrogen, methoxy or formamido; R^2 is an acyl group; CO_2R^3 is a carboxy group or a carboxylate anion, or R^3 is a readily removable carboxy protecting group; R^4 represents up to four substituents; X is S, SO, SO_2 , O or CH_2 ; m is 1 or 2; and n is 0, useful in the treatment of bacterial infections in humans and animals.